

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): Process for treatment of a feedstock that comprises hydrocarbons with at least four carbon atoms per molecule, whereby said feedstock comprises diene compounds and primarily butadiene as well as acetylene compounds in a minor proportion, whereby said process comprises a distillation stage of the feedstock introduced in a distillation zone that comprises a rectification zone and a drainage zone and at least one stage for hydrogenation of acetylene compounds in at least one hydrogenation zone with at least one catalytic bed under suitable hydrogenation conditions in the presence of a gas that contains hydrogen, ~~whereby the process is characterized in that~~ wherein a portion of the feedstock that circulates in the distillation zone that is enriched with acetylene compounds is drawn off laterally in liquid phase at a suitable draw-off level in the distillation zone and ~~preferably in the drainage zone; the hydrogenation stage is carried out in the~~ passed to a hydrogenation zone ~~that is~~ outside the distillation zone; a hydrogenation effluent that is low in acetylene compounds and enriched in oligomers is produced in said hydrogenation zone; and said hydrogenation effluent from said hydrogenation zone is recycled to a level in the rectification zone above the draw-off level, said draw-off level and recycle level being in communication with the same hydrogenation zone so as to create an internal reflux in the distillation column, whereby the process is ~~also~~ characterized in that a C4 fraction that comprises essentially all of the butadiene and that is low in acetylene compounds is recovered at the top of the distillation zone, and an oligomer-enriched C5 fraction is recovered at the bottom of the distillation zone.

Claim 2 (previously presented): A process according to claim 1, wherein the feedstock is a steam-cracking effluent that contains for the most part hydrocarbons with four to five carbon atoms per molecule.

Claim 3 (previously presented): A process according to claim 1, wherein the butadiene content in the feedstock is at least equal to 20% by weight.

Claim 4 (previously presented): A process according to claim 1, wherein the feedstock contains at most 20% by weight of acetylene compounds.

Claim 5 (previously presented): A process according to claim 1, wherein the draw-off flow rate is at most equal to twice the flow rate of the feedstock introduced into the distillation zone.

Claim 6 (previously presented): A process according to claim 1, wherein the feedstock is introduced at a level that corresponds to substantially the center of the distillation column; the lateral draw-off level is located below said center of the column at a height that corresponds to fewer than five theoretical plates from said center; and the hydrogenation effluent is recycled above the center of the column at a level that corresponds to a height within the first five theoretical plates from the top of the column.

Claim 7 (previously presented): A process according to claim 1, conducting the process so that the ratio of the acetylene compounds/butadienes concentrations is the highest at the level of the lateral draw-off.

Claim 8 (currently amended): A process according to claim 1, wherein the operating conditions of the distillation zone are as follows:

Number of theoretical plates: 35-45

Absolute pressure: 4-10 bar,

Top temperature: 30°C to 50°C

Bottom temperature: 90°C to 150°C

Claim 9 (previously presented): A process according to claim 1, wherein the operating conditions in the hydrogenation zone are as follows:

Absolute pressure: 2 to 70 bar,

Temperature: 30 to 60°C,

Volumetric flow rate 3 to 10 h⁻¹,

Ratio of H₂/acetylene compounds (mol/mol) = 0.5 to 3,

Noble metal catalyst of group VIII,

0.01 to 1% by weight stabilized by at least one metal of the group formed by Au, Ag, Sn.

Claim 10 (previously presented): A process according to claim 1, further comprising adjusting the temperature of the hydrogenation effluent upstream from the recycling level in the rectification zone of the distillation column.

Claim 11 (previously presented): A process according to claim 1, wherein said portion of feedstock enriched with acetylenic compounds is drawn off laterally from the drainage zone.

Claim 12 (previously presented): A process according to claim 2, wherein the majority of hydrocarbons have 4 carbon atoms.

Claim 13 (previously presented): A process according to claim 3, wherein the butadiene content in the feedstock is at least 50% by weight.

Claim 14 (previously presented): A process according to claim 4, wherein the feedstock contains at most 2.5% by weight of acetylene compounds.

Claim 15 (previously presented): A process according to claim 5, wherein the flow rates are approximately equal.

Claim 16 (previously presented): A process according to claim 9, wherein the group VIII metal comprises palladium.

Claim 17 (new): A process according to claim 1, wherein said draw-off level is in the drainage zone in said distillation zone.

Claim 18 (new): A process according to claim 17, wherein the hydrogenation effluent from said hydrogenation zone is recycled to said rectification zone in said distillation zone.

Claim 19 (new): A process according to claim 18, wherein the lateral draw-off level is located below the introduction of the feedstock to the distillation column and corresponds to fewer than 5 theoretical plates from said introduction of the feedstock, and the hydrogenation effluent is recycled above the introduction of the feedstock to the column at a level corresponding to a height within the first 5 theoretical plates from the top of the column.